AMENDMENTS TO THE SPECIFICATION:

Please substitute the following paragraphs in the specification for corresponding paragraphs previously presented. A copy of the amended specification paragraphs showing current revisions is attached.

Please amend the paragraph beginning at page 1, line 4:

This application is a continuation of and claims priority to Application Serial No. 09/721,778 filed November 27, 2000. The present invention relates to an apparatus for the ~~extracorporal~~ extracorporeal treatment of blood and more specifically to the automatic control fluid removal from the blood of patients suffering from fluid overload and averting therapy induced hypotension.

The paragraph beginning at page 11, line 21:

A safety feature of the controller is that it adjusts the filtration rate to avoid hypotension of the patient. If too much fluid is removed too rapidly from the blood of the patient, the patient may suffer from hypotension. The osmotic pressure across the filter membrane provides a good indicator of the blood volume and the osmotic pressure may be determined based on the pressure signal of the filtrate pressure sensor 109 (and, if needed, based on a comparative blood pressure signal from sensor ~~108~~ 112 or a differential pressure sensor used between two points).

The paragraph beginning at page 12, line 23:

The operator enters into the controller a desired level of osmotic pressure to be present across the membrane of the filter 111. By properly selection the osmotic pressure level, the operator can prevent excessive reduction of blood volume in the patient and ensure safety from hypotension. The controller monitors the blood and filtrate pressure signals from sensors ~~108~~ 107 and 109 (and, if present, from pressure sensors embedded in the filter and at the blood passage outlet 112 of the filter). The microprocessor controller (see Fig. 9) includes algorithms to control the ultrafiltration rate automatically based on the changes of osmotic pressure and the settings entered by the operator and preprogrammed into the controller.

The paragraph beginning at page 17, line 15:

Next, the blood pump 104 is stopped for a short duration of time, e.g., approximately 10 seconds, to eliminate effects of the remaining hydrostatic forces from the filter. Since the equilibrium is established via diffusion of molecules of solute across the membrane it requires certain time to establish. This period is kept as short as possible to reduce risk of blood clotting. FIGURE 4 illustrates the steady state condition in the filter in which both pumps 114 and ~~109~~ 108 are stopped. The pressure difference across the membrane (between the blood passage and the ultrafiltrate outlet sides of the membrane) as measured by the difference in pressures determined by pressure sensors

112 and 109 represents the osmotic pressure gradient across the membrane, and gravitational effects due to any height difference between the sensors. Pressure sensors 112 and 109 are shown as independent devices, but may also be implemented as a single differential pressure sensor used to measure osmotic pressure across the filter membrane. The gravitational effects can be determined based on the relative heights of the sensors 112 and 109 and the gravitational effects, once determined, can be mathematically eliminated from the pressure measurements so that the osmotic pressure can be determined.

The paragraph beginning at page 19, line 11:

The initial osmotic pressure 702 level may be measured at the beginning of ultrafiltration treatment. The osmotic maximum pressure limit 707 may be automatically established as the initial level 702 plus a predetermined delta osmotic pressure level, for example, 20% of the initial level. When the limit level 707 is reached, the controller automatically stops the ultrafiltrate pump or reduces the rate at which the fluid is removed. The blood pump speed is not changed while the ultrafiltrate pump is slowed or stopped. Between points 706 and 703, the blood volume in the blood circuit and filter is replenished from patient's tissue. The replenishment of unfiltered blood should cause the osmotic pressure level to return to the level 702. At stage 703, the ultrafiltration rate is increased. Many other control algorithms can be implemented to control ultrafiltration rate based on the osmotic pressure across a hemofilter membrane. Existing control

algorithms are well known, and may be modified to include patient safeguards based on monitoring osmotic pressure.